Section 3
Supplemental RI

3.1 Overview

This section addresses the methods that will be used to meet the objectives outlined in Section 1.3. During Phase I of this Supplemental RI, the PLPs will perform the soil and groundwater sampling and the hydrologic investigations identified in Sections 3.3 and 3.4, review and compile existing data about the Site, evaluate new and existing data, and determine if additional information may be needed to develop a feasibility study report. During Phase I, the PLPs will develop and carry out a soil sampling approach and subsequent work plan which will be subject to Ecology's approval. Additionally, if the PLPs determine during Phase I that additional characterization or modifications to the work plan will be necessary to fulfill the scope of the RI under this Work Plan, then the PLPs may notify Ecology and upon Ecology's approval, conduct such additional characterization during Phase I if doing so would serve to maximize the PLPs' resources. In the alternative, any additional work may be performed as part of Phase II. Specific methods that will be used to complete the field investigation are described in the Sampling and Analysis Plan (SAP) in **Appendix A.**

The PLPs will submit a Phase I report to Ecology according to the schedule in Section 5. The Phase I Report will describe the data compilation and results of the current soil and groundwater investigation, identify the remaining data gaps, recommend subsequent sampling events or other activities needed to fill these data gaps, and include other information needed to produce a feasibility study report. The Phase I report will be subject to Ecology's approval.

If Ecology determines additional investigations after the Phase I report are necessary to determine the extent of the contamination on the Site or to move forward with the feasibility study report, the PLPs will conduct Phase II of this Supplemental RI. A work plan for Phase II will be subject to Ecology's approval. Upon completion of Phase II testing, the PLPs will submit a Phase II Report to Ecology, subject to Ecology's approval. Sections 4 and 5 describe more fully documentation and reporting requirements and the schedule for this Supplemental RI.

3.2 Supplemental RI Data Compilation and Review

Substantial soil and groundwater data exist for the Site. For the Taylor Way Property, data are presented in a series of reports by CDM for remedial investigation and interim action activities that were conducted between 1993 and 2000, as well as KJC for activities that were conducted in 2002 and 2003. These reports are listed in Section 6, References. In addition, recent data was collected during investigation underneath the former railroad spur and during soil excavation from the areas of KJC borings B13 and B23 (CDM, 2005a and 2005b). Further, the Port of Tacoma recently collected additional soil data underneath and along the edges of the new building foundation preload and near two underground storage tanks that were removed in August 2005. Data on neighboring properties, including the Atofina and Port of

Tacoma properties, exist in Ecology's files; CDM currently has some of the information contained in Ecology's files, but may need to conduct a file review to obtain additional documents if necessary to complete the data compilation.

The PLPs will review all referenced recent and historical reports and compile all soils data that represent existing conditions. Soils data not currently applicable for the site, such as data generated prior to conducting interim actions (i.e., soil berm, soil excavated around MW9, soils in the petroleum hydrocarbon excavation, and soil excavated from the tide bank) will not be included.

New and historic groundwater data will also be reviewed and compiled. Groundwater data review will include current and historical groundwater quality and flow direction data for the Taylor Way property, the Atofina property, and the Port of Tacoma Property. In addition, available groundwater information on facilities to the west/southwest, across Taylor Way will be reviewed in order to identify other possible contamination sources.

The data compilation will include review, evaluation, and discussion of other potential contaminant source locations and contaminants of concern both on the Taylor Way Property (i.e., transformer pads, above ground tanks, waste disposal areas) and off of the Taylor Way Property (i.e., Port of Tacoma Property, Atofina Property, and properties to the west/southwest across Taylor Way).

3.3 Groundwater Investigation

3.3.1 Overview

The most recent Site groundwater sampling occurred over two years ago. Additional sampling needs to be conducted in order to determine current conditions and to evaluate effects of interim actions. In addition, because other properties near the Taylor Way Property, particularly the two adjacent properties, have or may have similar contaminants of concern in groundwater, the groundwater evaluation needs to consider possible interactions of contaminants and groundwater from, or to, these other properties. The PLPs will access existing wells on the Atofina Property and Port of Tacoma Property in order to measure water levels and collect samples for chemical analysis. Preliminary review of the data and a Site visit indicate the need to install two new wells on the Port of Tacoma Property, and repair/replace several damaged wells and reinstall one destroyed well on the Taylor Way Property, in order to provide a more complete groundwater evaluation. Finally, additional Site-specific hydrologic data needs to be collected to be used in developing Site cleanup levels.

3.3.2 Groundwater - Additional Monitoring Well Installation

Based on historical water level data, the groundwater flow direction across the Site is generally north, onto the adjacent Port of Tacoma property and then into the Hylebos Waterway. The PLPs will install two additional wells on the adjacent Port of Tacoma Property to provide data on metals concentrations downgradient of the Taylor Way

Property, just before the Hylebos Waterway. The PLPs will install the wells adjacent to each other. The PLPs will install one of the wells in the surface aquifer and the other well in the second aquifer. The PLPs will screen the wells at depth intervals similar to nearby wells on the Taylor Way Property, although specific conditions encountered during drilling may determine the need to modify those screened intervals. Additionally, the PLPs will repair/replace monitoring wells on the Taylor Way Property as appropriate. Existing monitoring wells MW3B, MW9, MW2 and MW14 will be repaired if possible. Any of these wells that cannot be repaired will be replaced. Former monitoring well MW7 will be replaced. MW10, which was destroyed during recent Site work, is not proposed for replacement at this time. Approximate well locations are shown on **Figure 2.**

3.3.3 Groundwater Sampling

The PLPs will collect groundwater samples on the Taylor Way Property from monitoring wells MW1 through MW14, except MW10. In addition, the PLPs will collect groundwater samples from selected monitoring wells on the adjacent Port of Tacoma Property (including new wells installed as described in 3.3.2.) and Atofina Property. Historical monitoring wells on the Port of Tacoma Property that will be sampled for this investigation include MW18 through MW21 as shown on **Figure 2.** On the Atofina Property, historical nearby wells that will be sampled include surface aquifer wells 1C3-1, 1B4-1, 1B2-1, 2D-1, and second aquifer well 1B3-2 as shown on **Figure 2.**

Groundwater samples will be analyzed for the following metals on the total and dissolved basis: antimony, arsenic, chromium, copper, nickel, lead, and zinc by EPA Method EPA Method 200.8 (ICP-MS) and for diesel-range petroleum hydrocarbons by Northwest Method WTPH-Dx.

3.3.4 Groundwater - Resurvey of Monitoring Wells

A licensed surveyor, on behalf of the PLPs, will survey the elevations and locations of each of the existing monitoring wells, newly installed monitoring wells, and accessed monitoring wells located off of the Taylor Way Property to ensure that current water elevation data are correct. The surveyor will also check the survey of the existing staff gauge on the adjacent 5-pile Dolphin in the Hylebos Waterway. If necessary, the PLPS will replace the staff gauge and resurvey it.

3.3.5 Groundwater - Water Level Monitoring

The PLPs will measure water levels in all Taylor Way Property monitoring wells and accessed monitoring wells located off of the Taylor Way Property during periods of high and low tide. Offsite wells include those identified for sampling as described in Section 3.3.3 and MW16 and MW17 on the Port of Tacoma Property. At least two full sets each of high and low tide water level data will be collected. The PLPs will use these data to generate groundwater contour maps both for the surface aquifer and the second aquifer. Continuous 24-hour water level monitoring will be conducted in

surface aquifer wells MW2, MW5, and MW6 and second aquifer wells MW8 and MW14.

3.3.6 Groundwater - Evaluation of Hydrogeologic Characteristics

The PLPs will determine Site-specific hydraulic characteristics by conducting slug tests in order to determine hydraulic conductivities and transmissivity. Slug tests will be conducted on four monitoring wells; MW2, MW3B, MW9, and MW19 (on Port of Tacoma property).

3.3.7 Stormwater Sampling

Similar to the groundwater, there are no recent stormwater data and it is necessary to conduct additional sampling in order to determine current conditions and to evaluate effects of interim actions.

The Port of Tacoma plans to install a new stormwater system at the Taylor Way property in the Fall of 2005. The PLPs will check the storm drain outfall for dry weather flow after the new stormwater system is installed and the system will be sampled if dry weather flow is observed. The PLPs will collect at least one wet weather sample at the appropriate timing. Turbidity, specific conductance, pH, and temperature of the stormwater will be measured in the field at the time of sampling. The samples will be analyzed for total antimony, arsenic, chromium, copper, lead, nickel, and zinc by the same methods as described for the groundwater samples and screened for petroleum hydrocarbons by NWTPH-HCID. Additional hydrocarbon analysis will be conducted as appropriate (i.e., NWTPH-Gx and/or NWTPH-Dx), if hydrocarbons are identified in the sample.

3.4 Soil Sampling

3.4.1 Scoping

Based on the review of existing data and results from the groundwater sampling under this work plan, the PLPs will present recommendations and a scope of work to Ecology for additional soil sampling to further refine the knowledge of the extent and depth of chemicals in soils across the site. Once Ecology approves the scope of work, the PLPs will develop a work plan for the soil sampling. The work plan will be subject to Ecology review and approval, and the work will be completed as a part of the Phase I investigation activities.

3.4.2 Soil Sampling in Drilled Borings

As discussed above, at least one monitoring well (MW7) will be installed on the Taylor Way Property during this supplemental RI. Additional replacement wells may also be installed if existing wells cannot be repaired. The PLPs will submit selected soil samples collected from drilled borings at the Taylor Way Property for analysis of total arsenic and lead. Sample intervals will begin at 2 ft below ground surface and

continue at 2 ft intervals until the groundwater interface is reached. Soil samples will be analyzed for total arsenic and lead by EPA Method 6010B (ICP).

Section 4
Documentation and Reporting

The PLPs, or their authorized agents, will document supplemental RI activities using field investigation daily reports, soil sampling records, groundwater sampling records, chain-of-custody forms, and additional forms as appropriate. Examples of these forms are included in the Sampling and Analysis Plan (SAP), **Appendix A** to this work plan.

4.1 Soil Sampling Plan

Within 30 days of submitting the final laboratory results from the groundwater sampling to Ecology, the PLPs will submit recommendations and a scope of work for further soil sampling. The scope of work will include supporting maps, tables, and summaries of relevant existing data and a rationale for the recommended sampling. The PLPs will prepare a draft work plan after Ecology has approved the scope of work. The draft work plan will be consistent with the scope of work outlined in Section 1.3 and will be subject to Ecology's approval. The PLPs will submit a final work plan and, after Ecology's approval of this work plan, implement the work plan. The PLPs will submit these documents according to the schedule set forth in Section 5.

4.2 Draft Supplemental RI Phase I Report

The PLPs, or their authorized representatives, will prepare a Supplemental RI Phase I Report as described below, in accordance with the schedule set forth in Section 5. The report is subject to Ecology's approval. If Ecology determines that no other sampling or investigations are necessary, upon Ecology's approval, this RI report will be the final RI report for the Site.

The Phase I report will include:

- Presentation of historical and current soil and groundwater data.
- Evaluation of contaminants of concern.
- Evaluation of lateral and vertical extent and concentrations of soil and groundwater contamination.
- Assessment of COC migration potential and affected media.
- Discussion of exclusion from the terrestrial ecological evaluation (TEE) in accordance with WAC 173-340-7491.
- Discussion of data gaps and identification of additional sampling needed prior to producing a feasibility study report.

The report will include figures showing current, historical, and planned Site features, including structures and the storm drainage system. Current and historical chemical data will be presented in summary tables, and where appropriate, in summary figures. Groundwater contour maps at high and low tides, both in the shallow and

deep aquifers will be provided, as well as graphical depictions from continuous monitoring. Laboratory reports and boring logs will be included in appendices.

A draft outline and schedule for a Feasibility Study (FS) Report will be submitted at the same time as the Supplemental RI Phase I draft report. The FS Report outline will include the elements of a Feasibility Study as described in WAC 173-340-350(8).

4.3 Supplemental RI Phase II

If Ecology determines that additional investigations are necessary for completing the feasibility study, the PLPs will submit a plan and schedule to conduct further work, consistent with the scope of work outlined in Section 1.3. The plan will be submitted to Ecology within 30 days of a written request from Ecology to create a plan. The plan and schedule will be subject to Ecology's approval.

Within 90 days of Ecology's approval of the Phase II work plan, the PLPs, or an authorized representative on their behalf, will submit a report summarizing the Phase I sampling results, , and explaining the results of the Phase II sampling. The report shall be subject to Ecology's approval. Upon Ecology's approval, this RI report will be considered the final RI report for the Site.

4.4 Electronic Data Submittal

Environmental data generated under this work plan and any subsequent work plans will be submitted to Ecology's Environmental Information Management System database, according to Ecology Toxics Cleanup Program Policy #840. (http://www.ecy.wa.gov/programs/tcp/policies/tcppoly.html)

Section 5
Schedule

The estimated schedule to complete the Supplemental RI is summarized as follows:

- Supplemental RI Phase I Groundwater Sampling - Mobilization and field work will be completed within 150 days of the effective date of the Agreed Order.

- Soil and Groundwater Analytical Data - The PLPs, or their authorized representatives will provide Ecology with soil and groundwater laboratory results throughout the Phase I sampling. The PLPs will provide Ecology the results within 14 days of the PLPs receipt of the final results from the laboratory.

- Soil Sampling Plan
  - Scope of Work: within 30 days of submitting the final groundwater sampling laboratory results to Ecology
  - Draft Work Plan: within 45 days of Ecology's approval of the scope of work
  - Final Work Plan: within 15 days of Ecology's comments on the draft work plan

- Hydrogeologic Monitoring - The PLPs, or their authorized representatives, will provide Ecology with the results of water level monitoring and slug tests within 14 days of conducting said monitoring.

- Supplemental RI Phase I report
  - Draft: Within 100 days from Ecology's approval of the final Soil Sampling Work Plan.

  - Final: The report will be subject to Ecology's review. Ecology will provide comments on the Draft RI Phase I report to the PLPs and the parties will establish a mutually agreed upon date for the PLP's resubmittal of the RI report. If Ecology determines that no further action is necessary, upon Ecology's approval, this RI report will be the final RI report for the Site.

- Outline and Schedule for Feasibility Study Report
  - Draft: Draft outline and schedule for Feasibility Study Report will be submitted with the Draft Supplemental RI Phase I report.

  - Final: Final outline and schedule for Feasibility Study report will be submitted within 30 days of receiving Ecology's comments on the draft FS outline and schedule.

- Supplemental RI Phase II: The PLPs will submit a Phase II work plan to Ecology within 30 days of a written request by Ecology. The plan is subject to Ecology's approval, and will include a schedule for completion of the work and submittal of

the RI Phase II report. The Phase II report will summarize the results of the Phase I sampling and explain the results of the Phase II sampling.

- Electronic Data Submittal: The PLPs will submit electronic data for each required phase of the Supplemental RI according to the same schedule as the final written reports.

Section 6
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